FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM

No. 666 (No. 39, Vol. XIII.) SEPTEMBER 29, 1921 [Weekly, Price 6d. Post free, 7d.

Flight

The Aircraft Engineer and Airships

Editorial Offices: 36, GREAT QUEEN STREET, KINGSWAY, W.C.2.
Telegrams: Truditur, Westcent, London. Telephone: Gerrard 1828

Annual Subscription Rates, Post Free

United Kingdom .. 30s. 4d. Abroad .. .. 33s. 0d.*

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates

* *European subscriptions must be remitted in British currency*

CONTENTS

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:

Oct. 1	Coupe Deutsch de la Meurthe
Oct. 6	Lecture, "Some Notes on Aeroplanes in Tropical Countries," by Air-Comd. H. R. M. Brooke-Popham, before R.Ae.S.
Oct. 20	Lecture, "The Langley Machine and the Hammondsport Trials," by Griffith Brewer, before R.Ae.S.
Oct. 22–30	Aero Exhibition, Prague
Nov. 3.	Pulitzer Trophy Race.
Nov. 3	Lecture, "Manœuvres of Getting Off and Landing," by Sq. Ldr. R. M. Hill, before R.Ae.S.
Nov. 12–27	Paris Aero Salon
Nov. 15–26	International Air Navigation Congress (Paris)
Nov. 17	Lecture, "Requirements and Difficulties of Air Transport," by Col. F. Searle, before R.Ae.S.
Dec. 1	Lecture, "Design of a Commercial Aeroplane," by Capt. G. de Havilland, before R.Ae.S.
Dec. 15	Lecture, "Development of the Fighting Aeroplane," by Capt. F. M. Green, before R.Ae.S.
1922.	
Jan. 5.	Lecture, "Specialised Aircraft," by Wing-Com. W. D. Beatty, before R.Ae.S.
Jan. 19.	Lecture, "Aeroplane Installation," by Brig.-Gen. R. K. Bagnall-Wild, before R.Ae.S.

EDITORIAL COMMENT

THE forthcoming trials of the D.H. 29 at Martlesham possess a very large measure of interest, because the machine which is to be tested—and which is fully described in this issue of FLIGHT—is one of a type which marks a considerable advance, in theory at least, over anything which has gone before. To begin with, it is a reversion to the monoplane, a type which was very much to the fore previous to the War, but which fell into virtual desuetude owing to, mainly, the limitations of the constructional knowledge of those early days. Unquestionably, the monoplane has very distinct advantages over other types, given that the requisite strength of construction is attained. Of this latter there can be no reasonable doubt, since the science of design and construction has progressed enormously since the days when the monoplane was tried and found wanting. The sum of this progress is represented in the D.H. 29 by the adoption of the cantilever principle of construction in the wing design. Not only is the requisite strength of construction attained by this method of designing the wing structure, but it has a very high safety factor, even when compared with the best of the biplane machines. It thus marks a very decided advance over previous methods of construction, and one from which a great deal is to be hoped. Naturally, much depends upon the trials which are now about to take place, and in the course of which the machine will be subjected to every species of test which can be devised to test the soundness of the machine itself and the theories underlying the methods of design.

The Development of Commercial Aircraft

More important than this is, we think, the fact that the construction of this machine, designed as it is for commercial purposes pure and simple, is another indication that we are cutting away as far as possible from the commercial-*cum*-military machine, which has hitherto done duty for the most part on such aerial lines as are in being. It may be that in the future the difference between the machine built for war and that designed for peaceful traffic will not represent the gulf which is fixed between the battleship and the liner. As to that it is impossible to dogmatise in the light of our present knowledge.

But there must of necessity be marked differences, and hence it is very satisfactory to regard the movement towards designing for commercial purposes alone. It is but natural, with the experience of the War so close at hand, that the designer should still have fixed in his mind that his machine should possess all the qualities which were called for in wartime. It must take time to clear this away, and it is good to know that apparently the idea is taking root that something different is wanted. In the meantime we can only wish D.H. 29 every possible success in her trials.

◆ ◆ ◆

Contracting the World

Aviation is rapidly contracting the limits of the earth. It is bringing within a few days' journey places which formerly were almost as remote as the planets in so far as concerns the facilities for travel. A good deal, for example, has been heard of the shortening of the time necessary to reach Baghdad, but it is only quite recently that the actual saving of time has been practically demonstrated by a real journey from the capital of Mesopotamia to England, made, as far as the existing facilities enable it to be made, in the air. The story of the journey is quite simple and commonplace. An officer of the R.A.F., proceeding home from Mesopotamia in the ordinary course of duty, determined to make the trip in the shortest time possible. Accordingly he flew from Baghdad over the newly-surveyed route to Egypt. He left the former place at 6 a.m. on the 15th inst., and made the flight across the Syrian desert to Ammam, 515 miles, in 8¾ hours on the same day. Starting early next morning, Heliopolis, another 325 miles, was covered by 9 a.m. Continuing the flight, he reached Aboukir the same day, the mileage for that day being a total of 440. The flight had been arranged to connect with the sailing of the s.s. *Vienna* from Alexandria, and within 40 minutes of arriving at Aboukir the officer embarked for the remainder of the journey to England by steamer and rail. He arrived in London on the evening of the 21st, having been actually six days and fourteen hours on the passage, a clear saving of from ten days to a fortnight on the next most rapid means of travel.

It will be remembered that this route between Egypt and Mesopotamia was surveyed by the R.A.F. and the ground organisation prepared in June last. A regular fortnightly air service for the carriage of official correspondence was opened on August 1. The route is intended as a link in the chain of air communications, which it is hoped ultimately to establish between England, the East and Australia. It is sometimes sententiously remarked that the world is a small place. Whether it actually is so or not is merely a matter of comparison. To our grandparents it was a very large affair indeed. Steam navigation, the electric telegraph and wireless have reduced its dimensions very materially in so far as rapidity of communications is concerned, but it is for aircraft to put the finishing touch upon dimensional contraction, if we may apply such a term to the really marvellous shortening of distances attained by their aid. What aerial communication means is well illustrated by the time-saving effected by the journey we have been quoting as a text for these remarks. Moreover, it must be remembered that only a comparatively small part of the journey was taken by air. Had it been possible to make the whole of the trip by aeroplane another two days must have been saved, thus bringing Baghdad actually within four days' journey of London. To us it seems wonderful. To our descendants it may well be that four days from here to the Mesopotamian capital will seem a shockingly dilatory journey. Who knows?

◆ ◆ ◆

Aviation in Australia

Probably Canada is the most forward of the Dominions in the development of aviation, but Australia seems determined not to be left behind in the race. According to a Sydney correspondent of *The Times* Trade Supplement, the Commonwealth Government has now decided upon a definite line of policy, and, as a first step, practical encouragement is to be given to the manufacture of aircraft locally. The Australian Aircraft and Engineering Co., of Sydney, has been firmly established, and the Government has placed with it an initial order for six machines of the 504 K Avro type. The works are adapted to rapid expansion, and the industry is expected to grow, especially as commecial aviation develops. The only materials that will have to be imported for the construction of the machines noted will be the fabric, ball bearings, steel bracing cables, and a certain amount of raw steel for making component parts. The 504 K type has been adopted by the Government as a standard, and a sufficient number of these machines, together with all necessary spare parts, is to be maintained at all the State training centres.

Last year the Commonwealth Government passed a measure to regulate and legalise air traffic. Machines, before being placed in commission for passenger services, are to undergo an inspection and test on the lines now familiar at home, while pilots have also to pass an examination in regard to qualification and physical fitness. The Civil Aviation Branch of the Defence Department has approved the establishment of aerial mail services between Sydney and Brisbane and Sydney and Adelaide. Tenders are being invited from private companies willing to undertake the work, while the Government has already accepted a tender for an air service between Geraldton and Derby, in Western Australia, a flying distance of 1,200 miles. All the services are to provide for both mails and passengers.

All this is very encouraging, showing as it does that the potentialities of aerial navigation are fully appreciated at the Antipodes. The beginnings are small, it is true, but all things must have a start. We think the Australian Government is to be very much congratulated upon its early enterprise. It is getting going in earnest, and as the Commonwealth is essentially a country in which aviation can do an enormous amount of good by opening up communications where none now exist, we look forward to very great developments within the next few years. Australia should be well in the front rank of commercial aviation before many years are past.

▣ ▣

R.A.F. "R.38" Memorial

THE Air Council, in deference to representations which have been made to them, have approved of a fund being opened in the R.A.F. to provide a memorial in the Western Cemetery at Hull over the grave of the officers and men who lost their lives on service in the "R.38."

▣ ▣

France to have a Soaring Competition

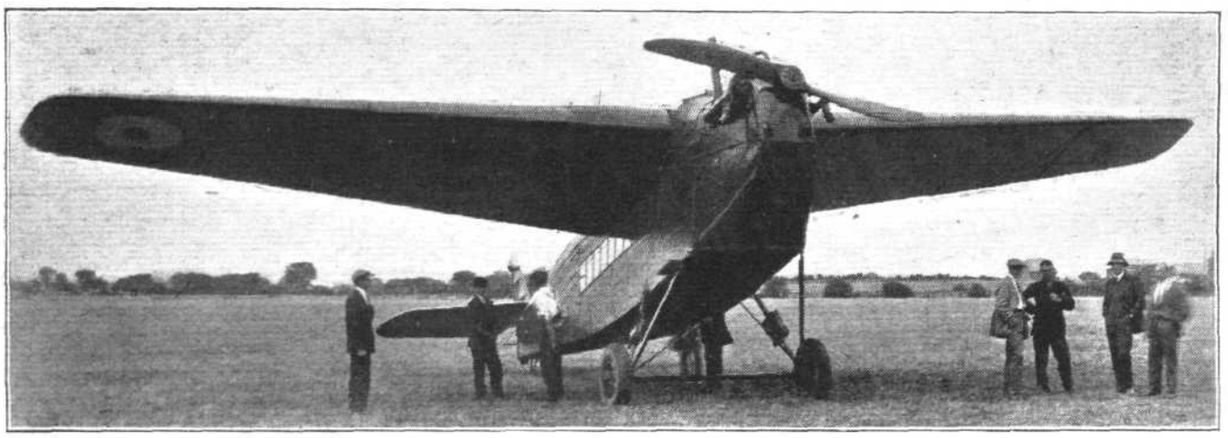
ENCOURAGED by the success attained by the Germans in the Rhön Mountains, the French sporting journal *l'Auto* announces that it has decided to organise a soaring and gliding competition in France during 1922. The rules and dates for the competition will be announced shortly.

THE D.H. 29 MONOPLANE

450 H.P. Napier "Lion" Engine

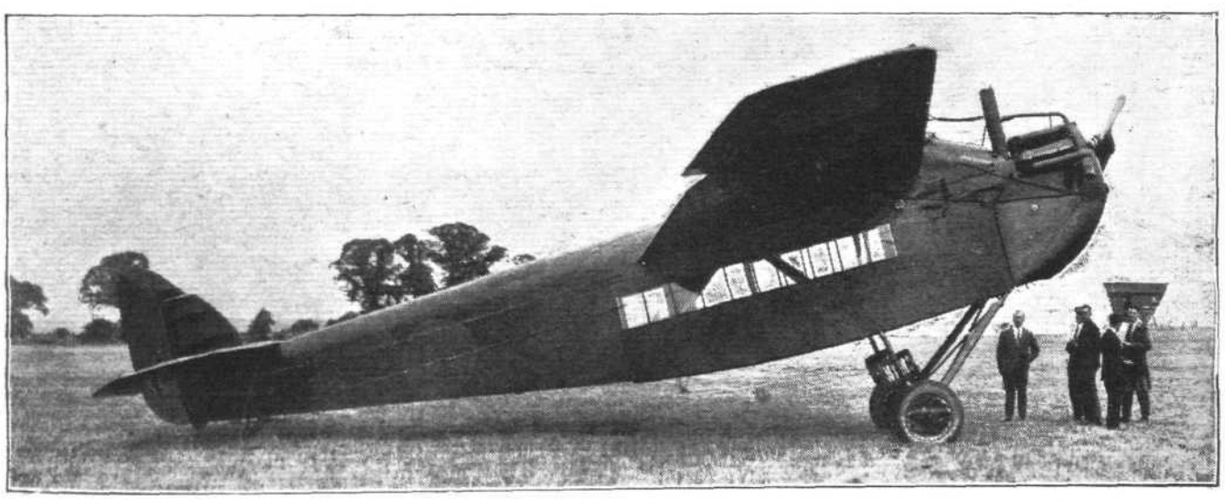
MORE than usual interest attaches to the new D.H. 29 monoplane which has just been finished at the Stag Lane works of the de Havilland Aircraft Co., not only on account of the fact that it is the first commercial aeroplane designed and built in this country to employ wings of the cantilever type, but also by reason of the many novel features incorporated in the design, quite apart from the internally braced wings. We think that we are correct in stating that when Captain de Havilland decided upon laying down the first of these machines, he had quite an open mind on the subject of cantilever wings. In certain quarters the cantilever wing has been dismissed with the off-hand remark that "there is nothing in it." By others it has come to be looked upon as the solution of all troubles, "a sort of blessed word, something like Mesopotamia," as Mr. J. D. North said at the air conference last year. As is usual in these cases, the truth is probably somewhere between the two extremes. It would appear that Captain de Havilland still retains an open mind on the subject, since his next commercial machine (first described in FLIGHT last week) is to be a biplane. This fact should not, however, be taken as an indication that de Havilland has met with disappointment in the monoplane. Far from it. As far as can be seen at present, the monoplane has justified itself, although until searching tests have been made it is too early to say whether or not it is an unqualified success. As the first of the monoplanes is now at Martlesham undergoing Air Ministry tests, official performance figures should be available before long. It should be remembered, however, that even if these prove as good as one has every justification for expecting they will be, there are other factors, apart from performance, which count heavily in a commercial machine. These can only be ascertained by actual use on the airways, but unless some unforeseen and unforeseeable drawback comes to light, the D.H. 29 should mark a real milestone in commercial aeroplane design, and Captain de Havilland and those associated with him deserve well of the aviation world in general for their courage in trying out the experiment.

At present two of the D.H. 29 monoplanes have been built. One of these was for the Air Ministry, and may not be referred to here. The second machine is being fitted up for commercial work, and is the one which forms the subject of the present description.



THE D.H. 29 MONOPLANE: Three-quarter front view. Under the left wing tip may be seen Captain de Havilland and his chief engineer, Mr. Walker.

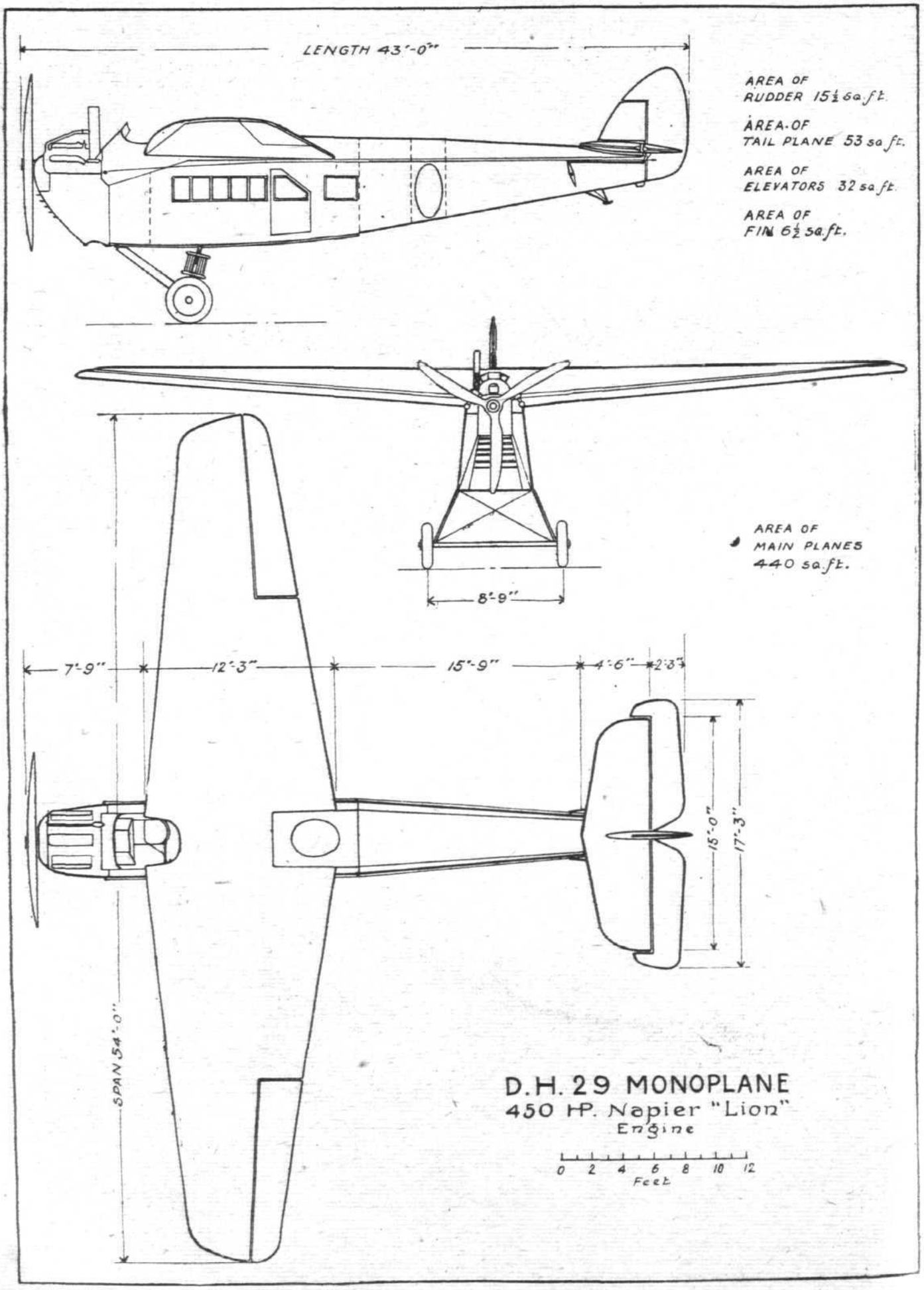
The first impression one receives in looking at the 29 is that the wing area is totally inadequate. This is, of course, due to the fact that a thick section high-lift wing is employed, which has a high L_c max. and thus gives the same landing speed for a much higher wing loading. It is a curious fact that the wing area of the monoplane is practically the same as that of the D.H. 4, which was quite a small machine, while the monoplane carries 12 people, 10 passengers inside the cabin and a pilot and navigator outside in front. When once one has become accustomed to the somewhat unusual appearance of the machine, she looks very pleasing indeed with her substantial *fuselage* and sharply tapering wings.



THE D.H. 29 MONOPLANE: Side view.

The Fuselage

Constructionally the *fuselage* is of interest in showing a total absence of wire bracing. The structure is in the form of spruce *longerons* and struts, covered with three-ply wood,



THE D.H. 29 MONOPLANE : Plan, side and front elevations, to scale.

which is tacked or screwed on, according to local considerations. The cabin portion of the *fuselage* is triangulated by deeply spindled H-section diagonal struts, and it is of interest to note that three of these transmit the weight of the wing to the points on the lower *longerons*, where are attached the struts of the undercarriage. Two run from rear chassis strut fitting to the wings spars, and a third from the front chassis strut to the front spar. These struts are of large dimensions, and look well capable of doing the work for which they were designed.

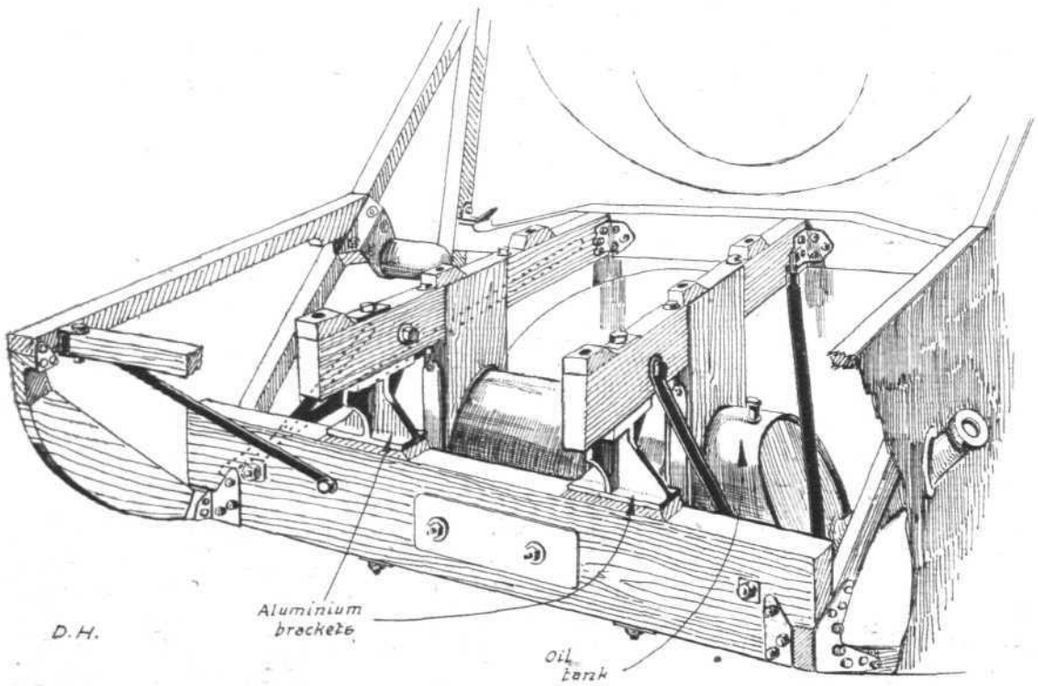
In section the *fuselage* is unusual, inasmuch as the floor is considerably wider than the deck or roof. The reasons which led to the adoption of this cross section were various, chief being probably that of getting a wide base for the attachment of the undercarriage struts. As the wing is placed above the *fuselage*, there is naturally a considerable height from the ground to the wing tips, and lateral stability on the ground, therefore, has to be attained entirely by a wide wheel track, the usual wing-tip hoops being, of course, out of the question. It is, however, probable that in later machines the section will be made rectangular, as this would considerably facilitate construction, where a departure from right angles at once means extra trouble and expense.

THE D.H. 29 MONOPLANE : Three-quarter rear view. The tail shown in this photograph has been slightly altered, the elevator having horn balances projecting past the end of the tail plane, as shown in the plan view of the general arrangement drawings.

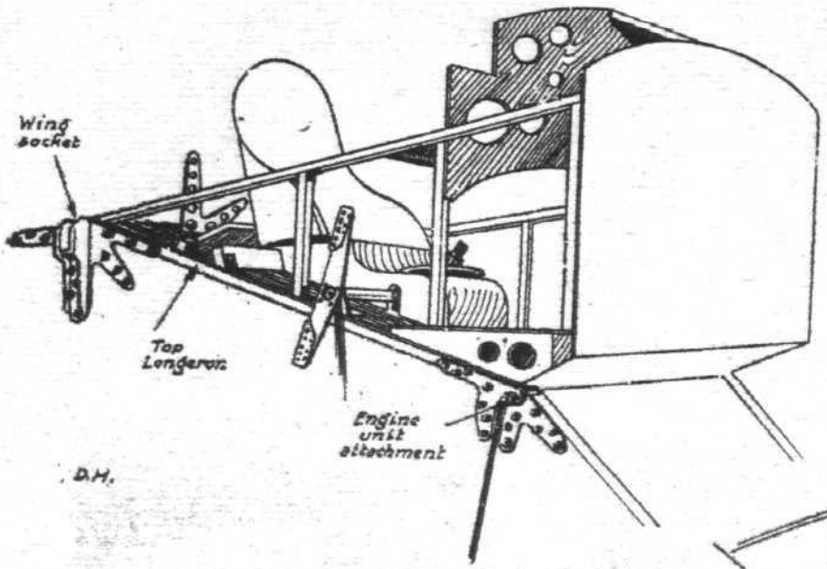
The Cabin

As a commercial machine, the main feature of the D.H. 29 is its large, light and airy cabin. Although being fitted with the same engine as that of the D.H. 18, *i.e.* a 450 h.p. Napier "Lion," the monoplane has seating accommodation, and ample at that, for ten passengers inside the cabin, while if necessary one more can be carried in the pilot's cockpit. The seats are arranged in two rows along the sides of the cabin, leaving a passage-way between the rows. The seats themselves are of the wickerwork type, which combines lightness with comfort. They are so attached to the floor of the cabin as to be readily detachable should it be desired to use the machine for carrying goods instead of passengers. The space available for goods then becomes 13 ft. 3 ins. by 6 ft. 6 ins. by 4 ft., equal to 345 cu. ft., not counting the luggage compartment, aft of the lavatory.

A door in the port side of the *fuselage* gives access to the cabin, and in the wall at the end of the cabin is a door leading to the lavatory. Aft of the latter, and separated from it by a partition, is a luggage compartment. In the front wall of the cabin is a trap-door giving access to the pilot's cockpit, which is in front of and above the cabin. It is thus possible for the navigator, wireless operator, or whoever is carried in the pilot's cockpit, to come down into the cabin and give any desired information to the passengers. This might often be found advisable in order to reassure passengers. For instance, in the case of engine failure, the navigator might be able to reassure passengers that, although a forced landing was about to be made, there was good landing ground below, and no cause for worry ; or again, it might be necessary to alight at some aerodrome other than that of the port for which the machine was bound. For instance, fog might be wirelessed



The D.H. 29 Monoplane: Sketch showing Engine mounting, which is a detachable unit.



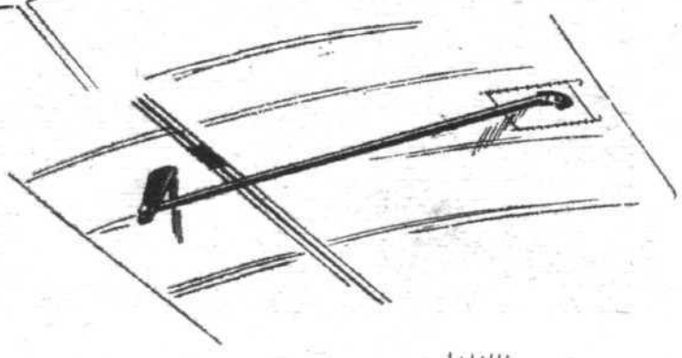
THE D.H. 29 MONOPLANE : The Pilot's Cockpit is placed above the top of the Fuselage and just in front of the Wings.

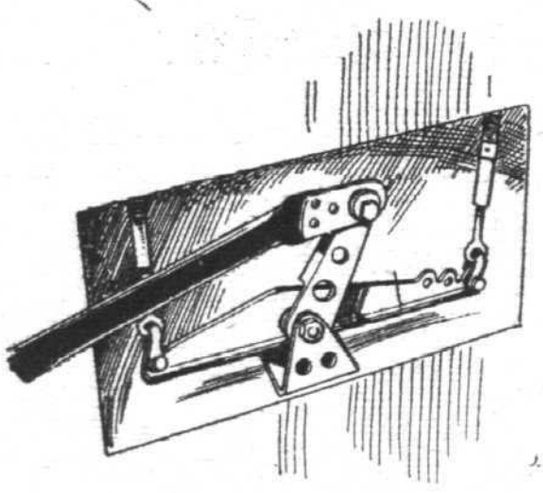
at Le Bourget, while Buc, Villacoublay or St. Cyr reported clear weather. If the passengers did not know of this, unnecessary uneasiness might be saved them by an explanation from the navigator.

This is only one example of the way in which Capt. de Havilland has studied the comfort and wellbeing of the passengers. There are many others. To take the questions of lighting and ventilation. Most probably the chief causes of air sickness in rough weather arises from bad lighting and ventilation. In the D.H. 29 large windows are fitted in both sides of the cabin, so that not only do the passengers obtain an excellent view, especially in the absence of a lower plane, but also the cabin is extremely light. Skylights are to be fitted in the roof, which will further increase the light in the cabin. The exact form which these skylights will take has not yet been decided upon, but probably they will be in the form of light frames with a white fabric covering which, doped with clear dope, will allow a considerable amount of light to filter through. If doped on to the roof of the cabin they will form excellent emergency doors, as a slight pressure would be sufficient to force them off.

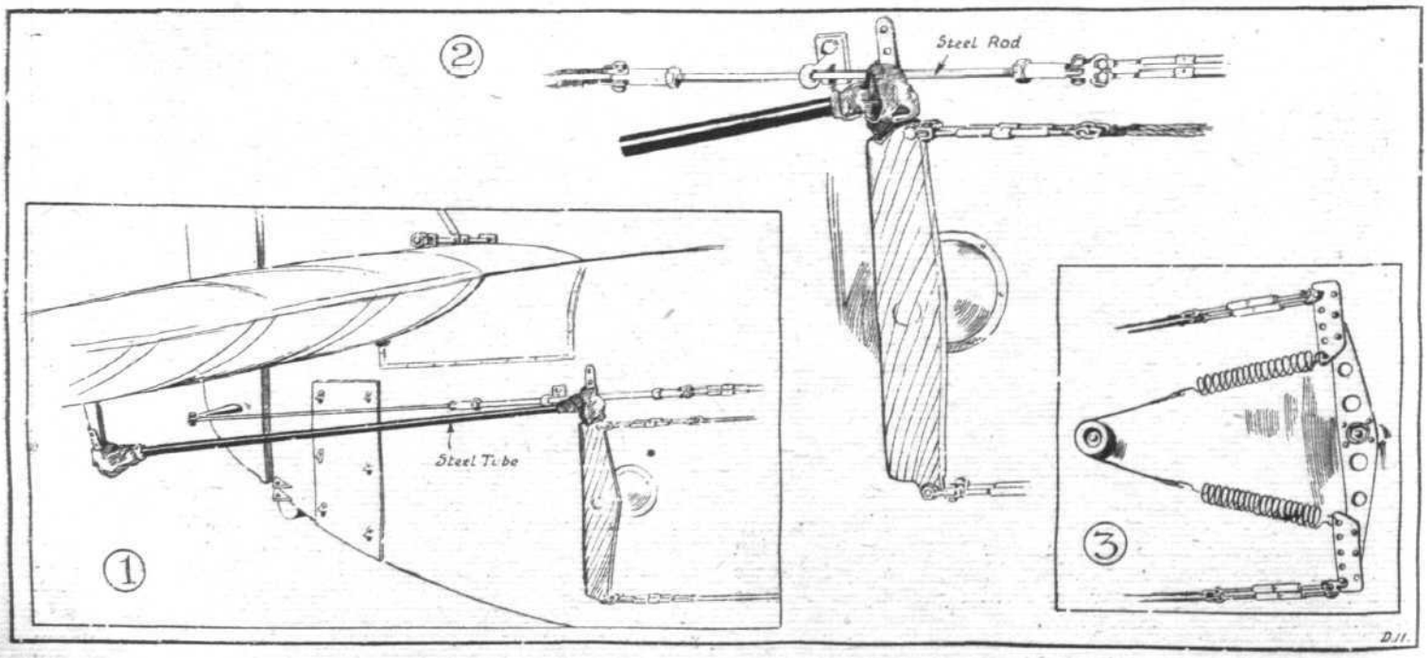
Heating and ventilation are also to be provided for, although the actual details have not as yet been finally settled. The heating will probably be by exhaust gas, and hot or cold air will be admitted by one valve, operated from inside the cabin. Fresh air and an equable temperature should therefore be available under all conditions.

Reference has already been made to the emergency doors in the roof, which form one item in the safety provisions. Another is formed by the ply-wood construction of the *fuselage*, which, in conjunction with watertight door joints, enables the machine to remain afloat for a considerable period should a forced descent in the sea ever have to be made. Owing to the wide *fuselage*, especially at the floor, the displacement is considerable, and the machine would probably float with only a relatively small portion of the body submerged. The doors in the roof would enable passengers to climb on to the top of the wings if rescue were delayed until the machine had settled up to the





THE D.H. 29 MONOPLANE : The ailerons are given a differential action by having the arms of the rockers of unequal length. A steel tube runs from the rocker to the aileron crank.



THE D.H. 29 MONOPLANE : 1, The steel tube which runs from the transverse shaft to the elevator crank is provided with leather protectors. 2, Steel rods are employed wherever the control cables have to pass through guides. 3, A spring loaded setting of the elevator takes the place of the usual trimming tail plane.

wings. The latter would probably keep the machine afloat almost indefinitely.

The Engine Mounting

As already mentioned, the power plant is a Napier "Lion." It is, as will be seen from the illustrations, mounted high in the nose, and the radiator is placed below and behind the engine, as in the D.H. 18's. Originally the engine was mounted somewhat lower, and had a nose radiator in front of it. As a matter of fact, one of our accompanying sketches shows the latter mounting, but fundamentally there is little difference in the various members of the supporting structure. The engine bearers are of ash, and rest on cross beams forming part of the engine mount unit. The oil tank is carried under the engine, while there is a water header tank above the engine, as shown in the illustrations. The cooling is altered by means of transverse slats of streamline section, as in the 18. When open the slats offer little resistance and allow the air free access to the radiator. When the slats are closed air is allowed to enter near the bottom of the radiator only. The feature is so well known from the 18's as to require no detail description here.

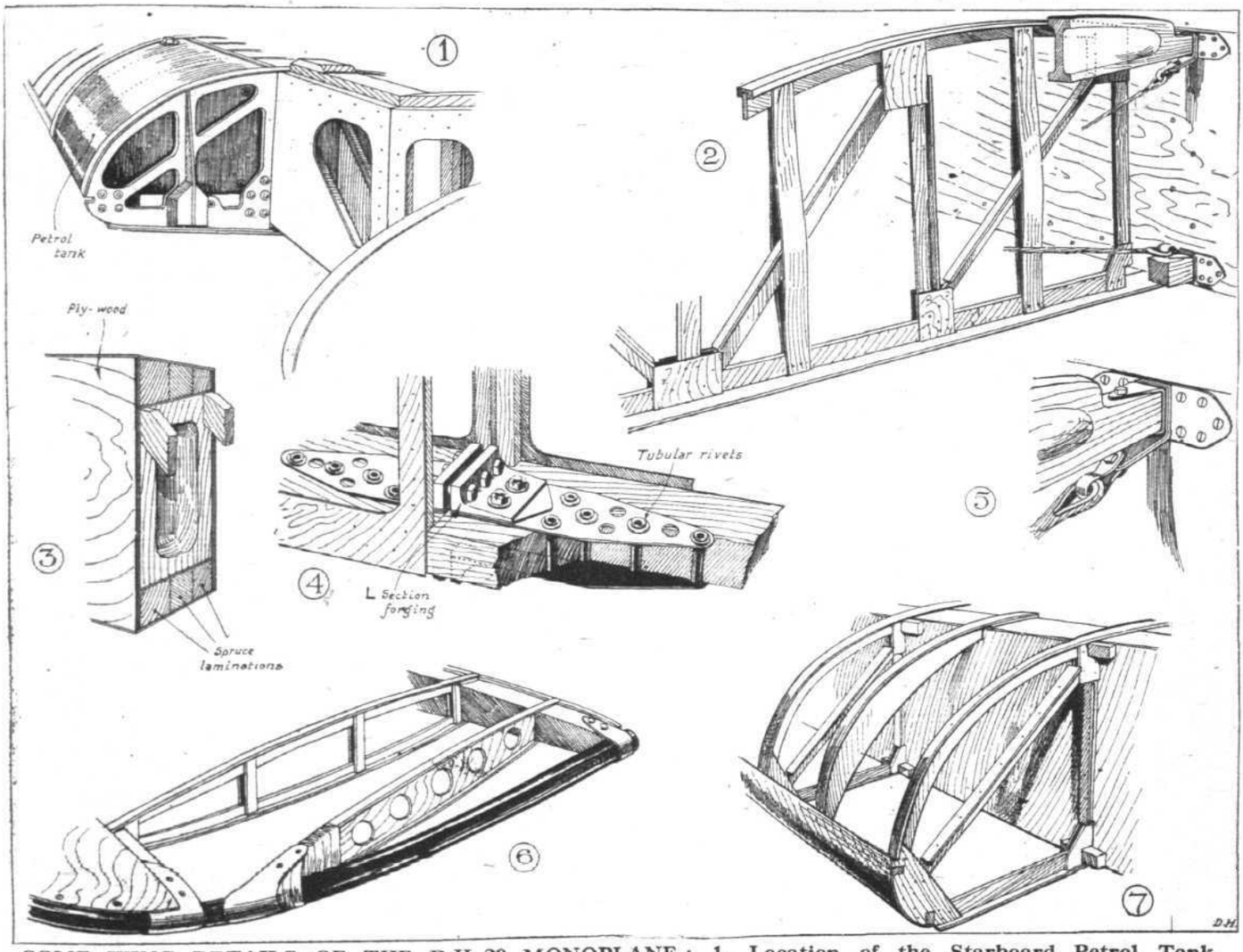
The whole of the engine mount structure is a complete unit, attached to the main *fuselage* framework with four corner bolts only. By undoing these four bolts and the petrol leads and engine controls, the whole engine unit can be removed and, if desired, a new one substituted. It might be added that Blaisdell Petro-Flex is used at all points where there are sharp bends, or where relative motion is likely to occur. Thus there should be absolutely no danger of a broken petrol lead anywhere.

The Petrol Tanks

The placing of the petrol tanks is somewhat unusual. Owing partly to the thick wing section used, and partly to the placing of the wing above the *fuselage*, it has been possible to place the two petrol tanks in the leading edge of the wing, one on each side. As originally arranged, the engine was low enough to allow of gravity feed direct to the carburettor, but with the new nose it would appear that there would be insufficient head, and consequently a low-pressure petrol system will probably be employed. However, the distance which the petrol will have to be pumped is so small that a very small pressure should suffice, and so no difficulty should be encountered, although the simplicity of gravity feed has much to recommend it.

The Monoplane Cantilever Wing

Regarded purely as a flying machine, and from the aerodynamical and structural points of view, the most interesting feature of the D.H. 29 is undoubtedly the monoplane cantilever wing. As we have already mentioned, there has been a good deal of controversy as to the merits of internally braced wings. There can be little doubt that aerodynamically this form of wing is superior to a braced wing, the aerofoil drag of which may be, and probably is, smaller than that of the internally braced wing. But by the time the drag of the bracing, etc., has been added to the aerofoil drag, it appears probable that a well-designed graded cantilever wing is superior. From the structural point of view the problem is less simple. *A priori* the internally braced wing would appear to be at a very great disadvantage. In reality this is less the case than might at first be expected. It is perfectly true that a cantilever wing will, for the same strength, be of greater weight per square foot, but on the other hand, this is not a fair comparison, since the cantilever wing has usually a much higher lift coefficient, and therefore requires a smaller area to support a given weight at a given landing speed. It has already been mentioned that the area of the D.H. monoplane is the same as that of the comparatively small D.H. 4 (*i.e.*,



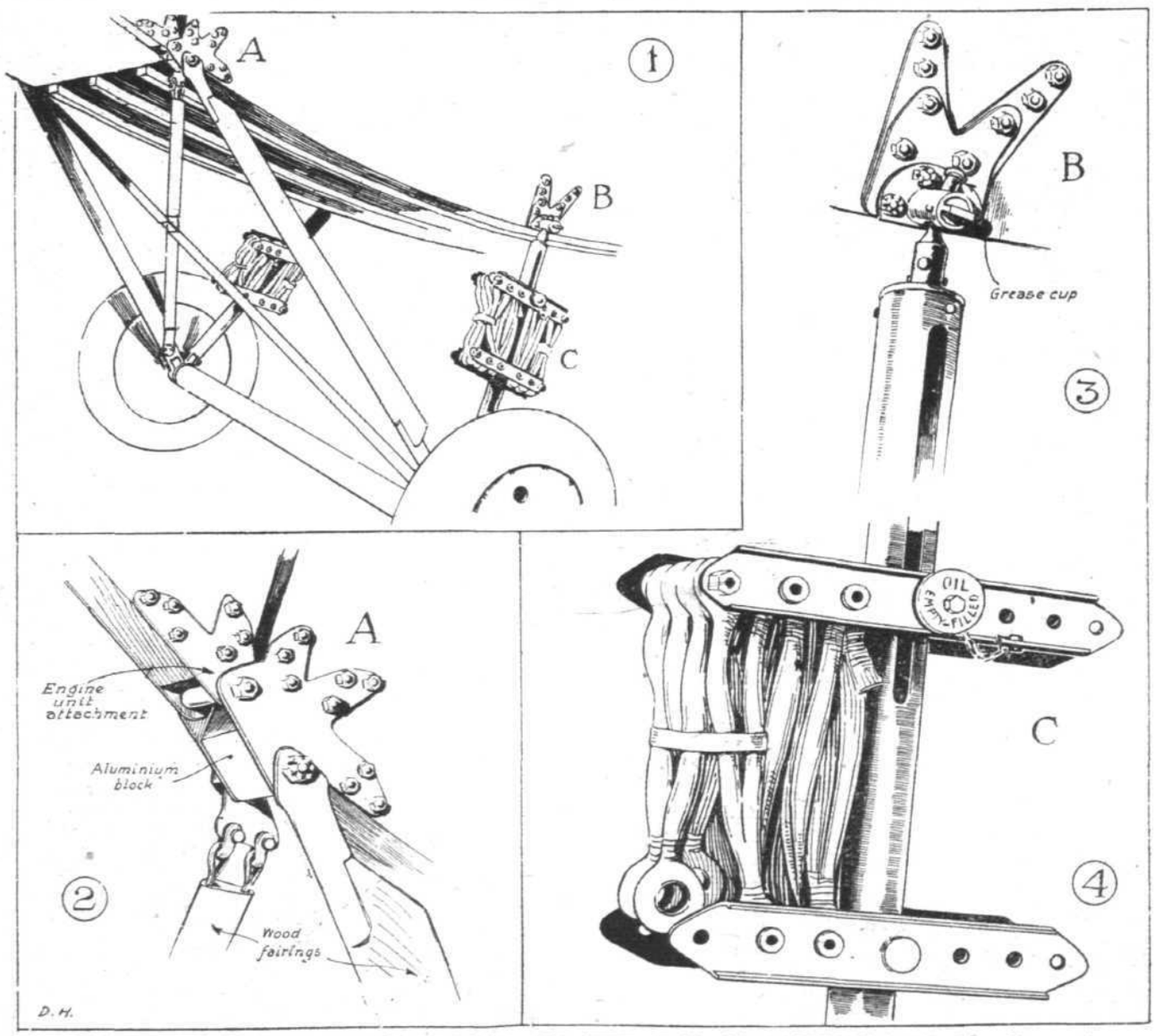
SOME WING DETAILS OF THE D.H. 29 MONOPLANE: 1, Location of the Starboard Petrol Tank. 2, Details of Rib Construction. 3, Sketch showing spar construction. 4, The two halves of the wing are joined as shown, by L-section forgings, steel plates, through-bolts and tubular rivets. 5, Compression strut attachment. 6, The tubular wing tip and its attachment to spars. 7, Construction of leading edge and nose ribs.

440 lbs.), and we are informed that the weight of the wings of the monoplane is 1,110 lbs. Judged on a basis of weight per sq. ft., this is a heavy wing (2.52 lbs./sq. ft.), but when the high lift coefficient is taken into account, the matter of wing weight assumes a different aspect. We have no data relating to the L_c of the wing of the D.H. 29, but assuming that a landing speed of 55 m.p.h. has been allowed, and that the total weight of the machine fully loaded is 7,000 lbs. (which is somewhere near the figure for which she has been stressed), the L_c max. works out at just over 1. This does not appear unattainable in a thick high-lift section. As the L_c max. of an ordinary section is generally about 0.6, the equivalent weight of the monoplane cantilever wing is virtually $2.52 \times 0.6 = 1.51$ lbs./sq. ft. This can scarcely be said to be a prohibitive figure in view of the various undoubted advantages of the cantilever wing. At the same time, we are not going to assert that even better results might not be obtained by a combination of thick high-lift aerofoils, more lightly built and having a certain amount of external bracing. In our opinion it appears quite probable that the future machine will have thick wings so as to be able to do with a minimum of outside bracing; for instance, one set of struts for a biplane so large that ordinarily two sets of struts would be employed. That, however, is another story. At present we may be presumed to have indicated sufficiently that compared with the ordinary high-speed low-lift wing the cantilever is not nearly so bad as many appear to think.

Coming now to the actual wing construction, the spars of the D.H. 29 are built up of spruce flanges with ply-wood sides, forming a box. As will be seen from the accompanying sketches, the flanges themselves are laminated, and consist of three strips with their vertical surfaces glued together. The spars have a pronounced taper from root to tip, and their upper and lower surfaces are warped, or rather shaped, to lie snugly against the rib flanges without leaving any space to be packed up, as was the case in the German Fokkers. The ribs vary somewhat in construction according to location, but generally speaking they are spruce flanges with light webs and distance pieces of spruce and three-ply. One of our sketches shows the general rib construction.

The compression struts are indicated in the same sketch, but at certain points they take another form. This is where the internal drag bracing is attached. With regard to the latter it is of interest to note that it is in duplicate, not in the usual way, but in two sets, of which one is near the upper surface and one near the lower surface of the wing section. Coupled with the fact that the compression struts are practically the full depth of the wing spars, this arrangement should help materially in giving rigidity to the wing. The "incidence" bracing (the wing is so deep that one feels justified in so terming it) is in the form of spruce struts froming a flat Z, which, with the duplicate drag bracing, completes the wing structure. The greatest difficulty with a cantilever wing is not so much to provide against direct bending stresses as against twisting with travel of the c.p. In the de Havilland monoplane it would appear that this difficulty has been entirely overcome, with the result that the wing is very rigid, and does not show any signs of dither.

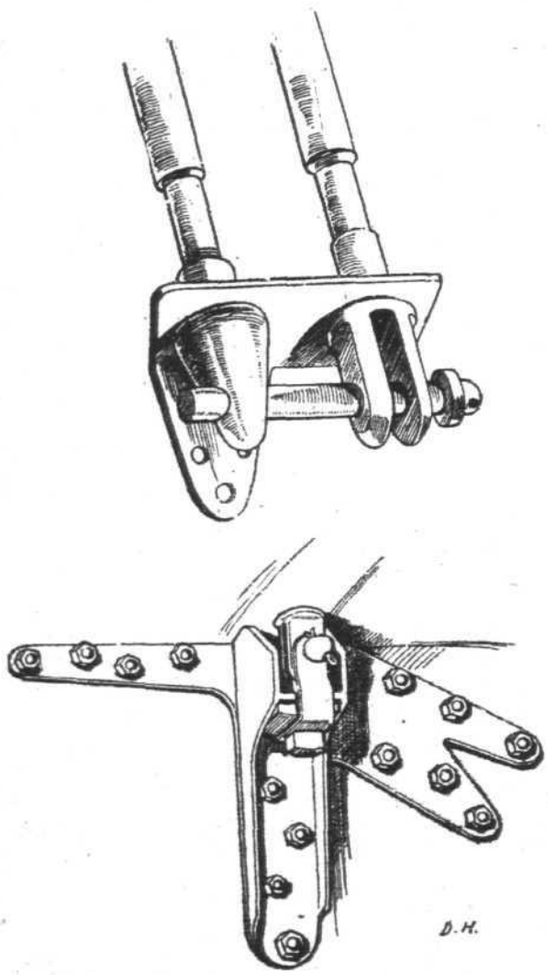
Another alleged difficulty with cantilever wings appears to have been refuted in the D.H. 29. It has generally been thought that with thick-section high-lift wings it was a necessity to have a rigid covering such as ply-wood or sheet metal, as such wings have been thought to be very sensitive to quite minute changes in curvature, such as may be caused by a slight sagging of the covering. Although the D.H. 29 is covered with fabric in the ordinary way, there does not



SOME DETAILS OF THE UNDERCARRIAGE OF THE D.H. 29 MONOPLANE: 1, General arrangement of the undercarriage. 2, Details of the swivel attachment of the front chassis strut to lower longeron. 3, Ball-and-socket attachment of rear chassis strut. 4, Details of the rubber shock-absorbers and oleo gear. Note how the arrangement has been simplified as compared with that of the D.H. 18.

appear to have been any trouble due to this cause. The machine was built during the very hot summer months, and has since been flying or standing in its hangar (a tent hangar at that) during wet spells. Yet so far as we are aware there has been no sign of a deterioration in performance such as might be expected if the slightest slackness in the wing fabric had the pronounced effect which has been alleged.

One of the greatest difficulties which beset modern designers is that of providing ample lateral control at or near the stalling angle. In the ordinary wing the effect when near stalling angle of pulling down the *aileron* on the lower side may, and frequently does, result in precipitating a spin rather than in righting the machine. The consequence is that in few machines is it possible to land as slowly as the maximum lift of the wing would otherwise allow. As spinning is a function of the lift coefficient and of the shape of the lift curve near the burble point, it may be expected that high lift cantilever wings would be worse in this respect than the ordinary high-speed wing. Thus the de Havilland Aircraft Co.



THE D.H. 29 MONOPLANE : Details of the fitting which secures the wings to the top longerons of the fuselage.

were faced with a double problem, as it were. It is of interest to see how they have solved it. As will be seen from the general arrangement drawings, the wings have a very pronounced taper—from approximately 12 ft. chord at the root to about 6 ft. near the tip. *Ailerons* of ordinary type are fitted, and do not appear to have any unusual aerodynamic features, such as being twisted after the fashion of most German *ailerons*. Nor, it will be seen, do they have any horn balance, as might have been expected in a machine of this size. The manner in which balancing has been provided while at the same time guarding against starting a spin is very interesting, and is almost ridiculously simple. The control cables are inside the wing, and are attached, at their outer ends, to a rocker arm lying in a fore-and-aft direction. From this rocker a steel tube runs to a king post on the lower side of the *aileron*.

As will be seen from the sketch, the two arms of the rocker are of unequal length (three holes are provided in the rocker shown in the sketch so as to allow of variation) so that a differential action takes place by which the *aileron* which is being pulled up moves through a greater angle than does the opposite one in descending. The consequence is that not only is the *aileron* on the low side not pulled down to such an extent as to give great resistance without a corresponding increase in lift, but the question of balance is solved at the same time. It might be added that all controls work in ball bearings, and this fact coupled with the method of balancing renders the lateral control of the machine so easy that we understand that the stick can be pulled over with one finger. The advantage which such ease and nicety of control has for long-distance commercial work is too obvious to need emphasising.

Before leaving the subject of the cantilever wing, it is of interest to examine the manner in which it is attached to the *fuselage*. The simplest way would have been to provide simple sheet-steel plates, as is often done. This, however, has the disadvantage that, in putting the wing back into place after it has been removed for overhaul or for any other reason, such relatively thin plates are very easily damaged, or at any rate bent, and have to be bent back to their original shape. By the time this bending has been done a few times the plates will have been weakened, and may give way in the air. It is therefore to be expected that a firm like the de Havilland Aircraft Co. would not countenance such a fitting. The one which has actually been used is shown in one of our sketches. There are, it will be seen, two long bolts which run through the wing spar. One of these has a conically-shaped head, and serves to locate the wing in a socket on the top *longeron*. The other has a forked end and takes the lift by way of a horizontal pin as shown. In order to provide duplication the first-mentioned bolt is also locked by the horizontal pin. As the head of the latter projects, the pilot can see at a glance whether or not his wing attachments are in order, and there is therefore not the slightest risk of going up with an unsecurely fastened wing attachment. The whole job is very neat and businesslike, and at once inspires confidence in the detail design, an impression which is confirmed on examination of the whole machine.

The Controls

Reference has already been made to the *aileron* control. As regards the elevator and rudder controls, these are of more or less standard form, with the exception that at no point do the control cables pass over pulleys or through fairleads. It has been the bitter experience of many airline firms that the wearing of control cables is a serious item. Wherever it has been necessary to carry a control cable through a guide in the D.H. mono., a length of steel rod has been incorporated in the cable and works in a substantial guide, as shown in our sketches. Moreover, the cables do not run direct to the elevator king posts, but terminate on the cranks of a transverse shaft some distance ahead of the tail plane. From these cranks steel tubes run to the elevators, and the hinged joints are surrounded with leather protectors and well greased, much after the style so familiar on motor cars. There should thus be no trouble with control cables on the D.H. mono.—a fact which will appeal strongly to users of the machines.

The tail plane itself is of cantilever construction like the wings, and elevators with horn balances are fitted. The fin and rudder are of the usual de Havilland type.

The Undercarriage.

After the success which the undercarriage of the D.H.18's has had, it was to be expected that the same type would be fitted on the monoplane. Certain modifications have been made, by way of cleaning up and simplification, but fundamentally the undercarriage remains the same.

It has already been stated that the first of the monoplanes has gone to Martlesham to be tested, and consequently no performance figures are available until these official tests have been made. From the flights that have been made at Stag Lane, with Captain de Havilland himself at the helm, there is every reason to hope that the performance will be very good, both as regards speed and load carrying. The following figures of weights are of interest. The structure weight of the machine is 2,687 lbs., of which 1,110 lbs. are accounted for by the wings. The weight of the machine empty, but with water, is 4,200 lbs. What the useful load will be depends partly upon the way in which the machine is found to get off and climb, but it may be stated that the structure has been stressed for a total weight of 7,500 lbs.

Whether regarded aerodynamically, or as an engineering structure, or as a commercial aeroplane, the D.H. 29 is a highly interesting machine, and Captain de Havilland, with his assistants, of whom one would mention Mr. Walker, chief engineer, and Mr. Hagg, head of the drawing office, are to be complimented upon a very fine production.

AN IMMEDIATE APPLICATION OF SLOTTED AEROFOILS

Their Use as Inter-Plane Ailerons

By "MARCO POLO"

IT is, of course, well known that in the majority of aeroplanes the landing speed is considerably above the minimum speed at which the machine is able to hold the air. The reason for this is chiefly that at angles of incidence corresponding to maximum lift the *aileron* controls are insufficient to give the necessary restoring effect. The consequence is that practically all machines are landed much faster than they need be if the controls were more effective. While this applies also to a considerable extent to longitudinal control, the latter does not appear to present as great difficulties, since here it is mainly a question of the size of the control surfaces and of suitable balances. As regards lateral control, however, the problem is more difficult, owing to the fact that, more or less irrespective of size, when the angle of maximum lift is reached the *aileron* which forms a part of the trailing edge of the wing becomes inoperative.

It appears to the writer that there is every probability that the old-fashioned inter-plane *ailerons* may be re-introduced. In the Curtiss machines of old these gave very good results, and enabled, for a time at any rate, the Curtiss Co. to get around the Wright wing-warp patents. When it is remembered that those *ailerons* were of streamline section, and consequently had no very great L_c max., it should be possible to do very much better in our "enlightened" days.

The suggestion which the writer would like to make is that it appears distinctly worth while to experiment with inter-plane *ailerons* formed by slotted aerofoils of the Handley Page type. There are several reasons for suggesting that this type would be more suitable than the fixed aerofoil of ordinary section. In the first place, the effect of slotting an aerofoil is to postpone "burbling" until a greater angle has been reached. Also, the lift is considerably increased. Both features would tend to make such an aerofoil particularly suitable for inter-plane *ailerons*.

Assuming that the slotted inter-plane *aileron* is so fitted on the machine that normally the slots are closed and the *aileron* is at an angle of incidence somewhat smaller than that of the main planes. The *aileron* would then be at an angle of attack which, if not corresponding to maximum L/D (which is not necessary for an *aileron*), would be at a small angle corresponding to small drag (which *is* very desirable for an inter-plane *aileron*). When called into use, the *aileron* on the lower side would have its slots opened slightly, and would thus increase its lift and tend to right the machine. On alighting, or when flying at or near stalling speed, the *aileron*, being set at a smaller angle of incidence than the main planes (assuming the *aileron* to be of the same section as the wings), would not have reached the angle of maximum lift when the main planes had reached or even exceeded this angle. Added to this fact, the opening of the slots would still further postpone the angle of maximum lift of the *aileron*, so that, several degrees beyond the "burble point" of the main planes, the *aileron* would continue to increase its lift, and consequently be capable of exerting a righting force.

The matter of finding out the best section, slot formation and operation, and proportions of *ailerons* for any given machine would probably be one for full scale experiment, but in view of the fact that *ailerons* are not, in any case, of very large area, such experiments need not be very costly, and the gain to be anticipated would appear to be such as to make the experiments well worth while.

It might be objected that such inter-plane *ailerons*, with their operating gear, would offer a considerable amount of extra resistance. While this is probably not to be denied, it should be remembered that the virtual landing speed of the machine would be reduced by the use of such *ailerons*, and that consequently the wing area itself might be reduced to give the same maximum speed. There would probably still be a considerable gain in practical landing speed.

The writer offers the suggestion for what it is worth, and the Editor of this Journal has kindly offered to place at disposal space for a discussion of the problem if any reader should feel disposed to take the matter up.

THE LONDON-CONTINENTAL SERVICES

FLIGHTS BETWEEN SEPTEMBER 18 AND SEPTEMBER 24, INCLUSIVE

Route‡	No. of flights*	No. of passengers	No. of flights carrying: Mails	No. of flights carrying: Goods	No. of journeys completed†	Average flying time (h. m.)	Fastest time made by	Type and (in brackets) Number of each type flying
Croydon-Paris	22	61	6	13	18	2 58	D.H.18 G-EARO (2h. 12m.)	B. (3), D.H.18 (1), G. (4), H.P. (2), Sp. (5), V. (1).
Paris-Croydon	23	61	10	18	18	3 1	D.H.18 G-EARO (2h. 30m.)	B. (4), D.H.18 (1), G. (4), H.P. (2), Sp. (5), V. (1).
Croydon-Brussels ...	8	7	4	4	5	2 40	D.H.4 O-BALO (2h. 17m.)...	D.H.4 (4), D.H.9 (2), G. (1), Sp. (1).
Brussels-Croydon ...	7	8	6	4	2	4 4	D.H.4 O-BATO (2h. 27m.)...	D.H.4 (4), D H.9 (2), R. (1).
Croydon-Amsterdam ...	4	3	4	4	2	3 18	Fokker H-NABL (3h. 1m.)...	D.H.9 (1), F. (2).
Amsterdam-Croydon ...	3	—	3	3	3	3 33	Fokker H-NABL (3h. 11m.)	D.H.9 (1), F. (2).
Totals for week ...	67	140	33	46	48			

* Not including "private" flights. † Including certain journeys when stops were made *en route*.
‡ Including certain diverted journeys.

Av. = Avro. B. = Breguet. Br. = Bristol. Bt. = B.A.T. D.H.4 = De Havilland 4, D.H.9 (etc.).
F. = Fokker. Fa. = Farman F.50. G. = Goliath Farman. H.P. = Handley Page. M. = Martinsyde. N. = Nieuport.
P. = Potez. R. = Rumpler. Sa. = Salmson. Se. = S.E.5. Sp. = Spad. V. = Vickers Vimy. W. = Westland.

The following is a list of firms running services between London and Paris, Brussels, etc., etc.:—Co. des Grandes Expresses Aériennes; Handley Page Transport, Ltd.; Instone Air Line; Koninklijkie Luchtvaart Maatschappij; Messageries Aériennes; Syndicat National pour l'Étude des Transports Aériens; Co. Transaérienne.

Audibility of Oppau Explosion

THE Air Ministry announces that as the distance of audibility of sound is of great scientific importance in questions relating to the structure of the atmosphere, the Director of the Meteorological Office, Air Ministry, would welcome information from those who heard the sound of the Oppau explosion.

FLIGHT

LONDON TERMINAL AERODROME

Monday Evening, September 26.

THE bottom has fallen out of the passenger traffic this week. Some machines have departed, and arrived, without a single passenger, and a number have had only one or two. During the whole week the Grands Express have only carried 24 passengers, as against a weekly average of well over a hundred through the height of the summer; and other companies show a similar drop.

Captain Greig, of the Messageries Aériennes, is of opinion that the "R.38" disaster has been the cause of this "slump"; but the majority of airway experts believe that the American tourists are returning home much earlier this year, and, as a large proportion of the summer's passengers have been Americans, there is probably something in this explanation.

It is possible, on the other hand, that the general trade "slump" is now affecting the airways adversely. It is certain that people are really beginning to economise, and many who would in the ordinary way travel to the continent are staying in England, or else travelling by the cheapest method—all of which, of course, is bad for "airways."

Goods traffic, too, is far from satisfactory; and, although the various air transport firms are striving for larger loads, this traffic—except to and from Holland—is practically negligible. The K.L.M., in fact, carry a larger quantity of goods than all the other lines put together.

Mist and Fog along the "Airway."

THE weather has been all against regular flying throughout the week. There has been fog in the early morning, and, in the evening, the mists thicken before the final machines are scheduled in.

Saturday was a particularly bad example of this type of weather. As late as 8 p.m., when it was quite dark, no fewer than four expected machines had not put in an appearance at Croydon, and the aerodrome "firework display" came into operation—scores of rockets and shells being sent up.

This display was kept up until about 9 p.m., when news came through that the D.H.18 had landed at Penshurst, the Handley Page at Maidstone, a Breguet at Lympne, and a D.H.9 returning from Mulheim at St. Inglevert. When the weather was at its blackest at Croydon, Captain Muir went up, in one of the Surrey Flying Services "Avros," just to see what it was like.

British Commercial Aeroplanes for Spain

ON Friday two four-seater D.H.9's, reconstructed for commercial passenger-carrying by the De Havilland Aircraft Company, left for Spain. They got off together, and disappeared over the mist in the direction of Lympne, flying almost wing-tip to wing-tip. Mr. Cobham was piloting one of them, while the other, which carried an Aerofilm Company's photographer with fan aero-camera and an enormous supply of plates, was in the hands of Mr. Ortweiler. These machines are the first of a batch that the De Havilland Company have sold to the Seville-Laroche air service. I understand there is now to be a regular air line between Seville and Laroche, in Morocco.

There are still fairly regular consignments of Bristol "fighters" and D.H.4's leaving for Spain. I hear, for instance, that the Bristol Company are delivering ten of their "fighters," and that the Aircraft Disposal Company are sending 40 "fighters" and 14 D.H.4's.

Several of the pilots who deliver these machines by air to Spain report that, while flying over the Pyrenees, they have encountered eagles. Mr. Piercy, on his last journey, saw four eagles all flying above him at a height of between 8,000 and 10,000 ft. One of them, he declares, turned its head sideways and downwards and closely examined the aeroplane; but, evidently deciding that it was too big to tackle, finally made off.

After many vicissitudes, it is hoped that at last all is now well with the Shell bulk-storage petrol plant. The original elaborate apparatus was not considered satisfactory, and was dismantled, and another erected. This, however, was found to be delivering short measure to the tune of 1½ pints in five gallons. The Shell Company then put the matter into the hands of the Bowser pump people, and on Saturday Mr. H. G. Byrnes, the Bowser service engineer, who has been in charge of the work since Bowser's took hold, informed me that he had just tested the new installation and that it was now quite "O.K."

The Shell Company consider the business on the aerodrome of such importance that they have appointed their own representative to look after it, and Mr. A. Sant, who is to represent them here, took up his duties at the air-port on Monday.

"Sniping" Balloons from Aeroplanes

ON Saturday, Colonel Riske and Colonel Spenser Grey, two members of the Royal Aero Club, had a balloon "sniping" competition from Avros. This was led up to by the postponement of a similar competition in last week's Aero Club races, the two Colonels having a personal wager of £25 on the result. One of the Avros, piloted by Captain Muir, and with Colonel Riske armed with a shot-gun loaded with dust shot in the passenger's seat, ascended; and then at two-minute intervals three small hydrogen-filled balloons, which rose at 300 feet a minute, were released. Colonel Riske, thanks to some fine piloting by Captain Muir, and extraordinary marksmanship on his own part, shot down all three balloons with only three shots in 8 minutes 21 seconds. The second Avro then ascended, piloted by Major Draper, and with Colonel Spenser Grey as marksman; but, although he fired several shots and brought down the first balloon, the last two rose into the clouds and were lost.

A race between three Avros, piloted by Colonel Spenser Grey, Major Draper, and Captain Muir, which followed resulted in a win for Major Draper.

I hear that three companies, which propose to run services to Paris, have been approved under the Air Ministry's revised subsidy scheme. These are the two existing services—the Instone Air Line and Handley Page Transport—and a new one with Colonel Searle at its head. It is also rumoured that a service to Brussels has been approved; but details of it are, as yet, lacking. The terms of the subsidy have, I am informed, been made more generous, as the various air transport companies said it was impossible to make services pay under the conditions of the original proposal.

A very Dangerous Oversight!

THE airship mast is growing smaller. All the gear at the foot has been removed, and the mooring-head is now down. The whole mast is to be taken to Cardington for storage.

One very dangerous mistake has been made, having regard to the type of weather we are now experiencing. All the obstruction lights have been removed from the mast, and the cables disconnected, though the mast is still over 100 ft. high. On Saturday last, when machines were missing and it was expected they might try to land through the mist all the other obstacles on the aerodrome were illuminated, but the mast, the highest obstacle for miles, was in darkness with its summit in the clouds—a veritable death-trap to any pilot attempting to glide into the aerodrome in the darkness and mist. Surely the lights could have been removed a few at a time as the mast was pulled down!

Captain Muir, of the Surrey Flying Services, has been exceptionally busy lately. He is, of course, in charge of the Royal Aero Club's machines, and has had to have them in tip-top order, not only for the races, but also for last Saturday's competition.

In addition to this, he has purchased a large number of Siddeley "Puma" engines, and has a staff of mechanics busily reconditioning them in one of the aerodrome hangars. There is quite a demand for "Puma" engines.

The Business of "Joy-Riding"

Captain Muir tells me that, so far this year, he has taken up over 7,000 people for joy-rides. This is in addition to inland "taxi" work and cross-Channel flights. There is evidently still a good thing to be made out of joy-riding.

Mr. Piercy, by the way, is convinced that Spain is an "Eldorada" for any enterprising firm which has a few machines, and is prepared to lay itself out for business. It appears that the Spanish local authorities in many of the towns and villages are so keen on flying that they are ready to pay quite large sums to a firm who will undertake to give a flying week in their particular locality, while the enthusiasm of the Spaniard for joy-riding would also mean a considerable amount over and above any sum the municipalities might give. The newspapers again made a good use of the air services to get their photographs of the German explosion to London in record time.

Some pictures were sent by way of the Paris-Warsaw air service, being put on board an aeroplane at Strassburg, and continuing from Paris to London by air. One of the D.H.9's of the De Havilland "taxi" service also went to Mulheim to bring back pictures of the disaster.

◘ ◘

"The Position of Aviation Today"

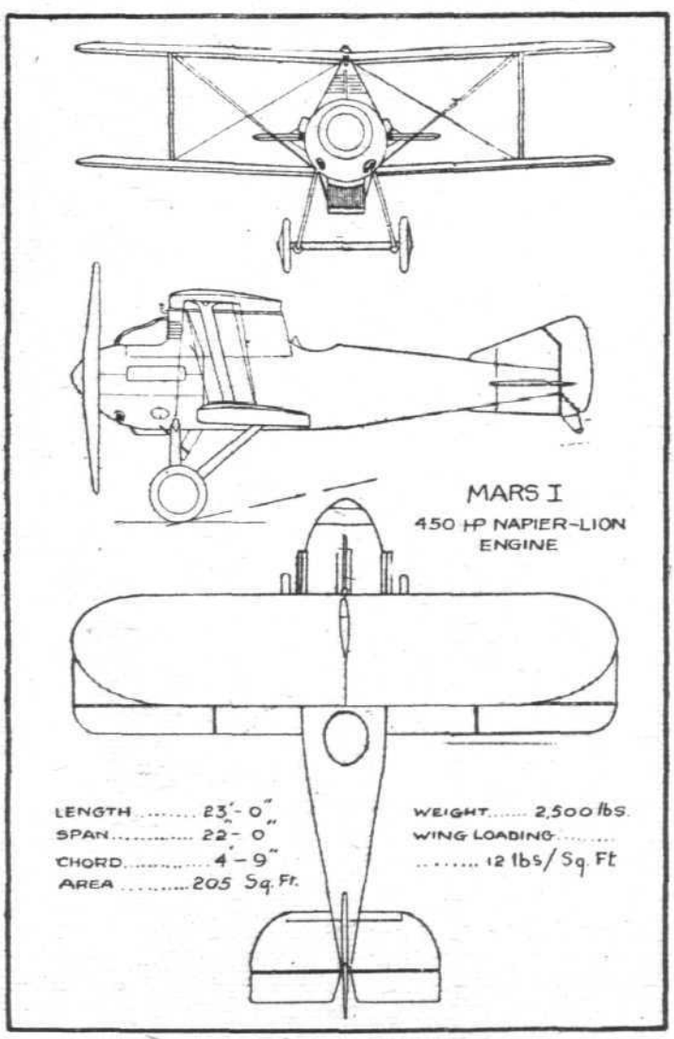
WITH the above as title, a paper will be read on October 19 by Maj.-Gen. Sir Sefton Brancker before the N.E. Coast Institution of Engineers and Shipbuilders.

THE COUPE DEUTSCH DE LA MEURTHE

To be Flown on Saturday

THE speed race for the Coupe Deutsch is to be flown over the old Gordon-Bennett course on Saturday of this week. The start will be made at Etampes (Villesauvage aerodrome) and the turning point is to be at La Marmogne, a distance of about 50 kilometres. As the total distance of the race is to be 300 kilometres (186 miles), competitors will make three out-and-home trips, the winner to be the pilot who completes the course in the shortest time. Several machines were entered by France, and elimination trials were held on September 28. Now that a most regrettable accident has occurred to the de Monge, which resulted in the death of Count Bernard de Romanet, there are only four French machines left from which to choose: the Hanriot all-metal monoplane, the two Nieuport-Delage "Sesquiplans," and the G.B. type Nieuport biplane.

Italy has entered one machine, a Fiat, to be piloted by Brack Papa. This machine—of which, unfortunately, it has not been possible to obtain more than a few particulars—has an engine of 700 h.p., and is thus by far the most powerful machine entered for the race. It does not, of course, follow that it will be the fastest. It is stated to have a span of about 25 ft. and a wing loading of about 13 lbs./sq. ft.

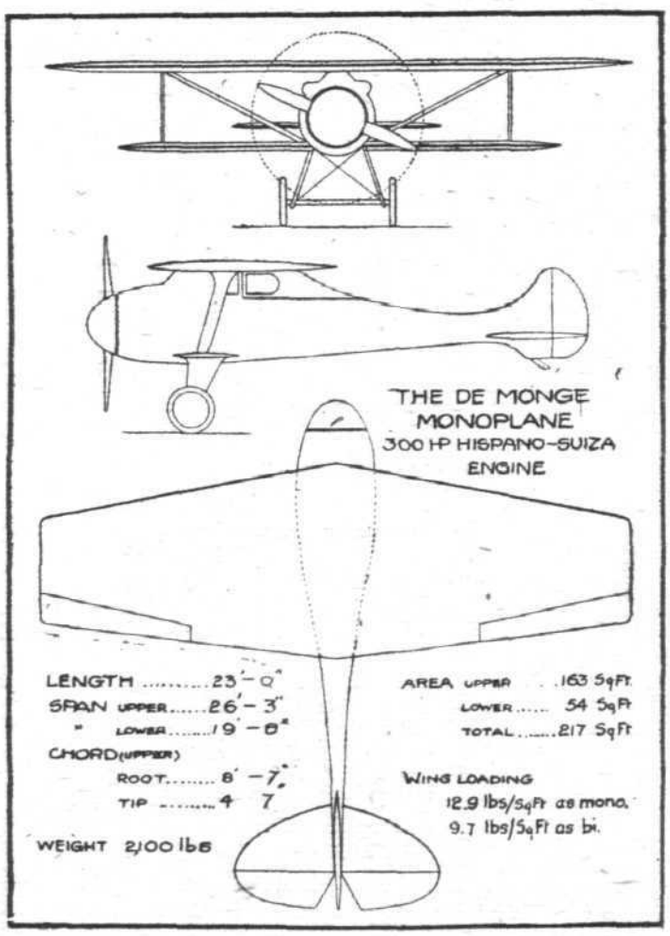


The Mars I biplane.

Next in power comes the British entry—the Mars I, 450 h.p. Napier "Lion" engine. This machine, which was designed by Mr. Folland for the Gloucestershire Aircraft Co., was, it will be remembered, the winner of the Aerial Derby and first prize in the Handicap. As in the previous race, the machine will be piloted by Mr. J. H. James, who won great praise from all sides last year by flying the British Nieuport racer across from Hendon to Etampes. Unfortunately, he arrived too late for the machine to be allowed to take part in the Gordon-Bennett, but this year his machine is being sent over by boat and train, and except for accidents should be at Villesauvage in time. As this is James's first international race, and as he is the only British competitor, we are sure all our readers will join us in wishing him the best of luck on Saturday. His machine has been "cleaned up," and is now very much faster than she was in the Aerial Derby, so that he should stand a good chance, although he is admittedly not going to have an easy time of it, what with the crack pilots and "projectile" machines entered by France.

In the accompanying sketch-drawings we show the general arrangement of some of the machines entered. The diagrams are not to scale, but serve to give an idea of the general lines of the machines.

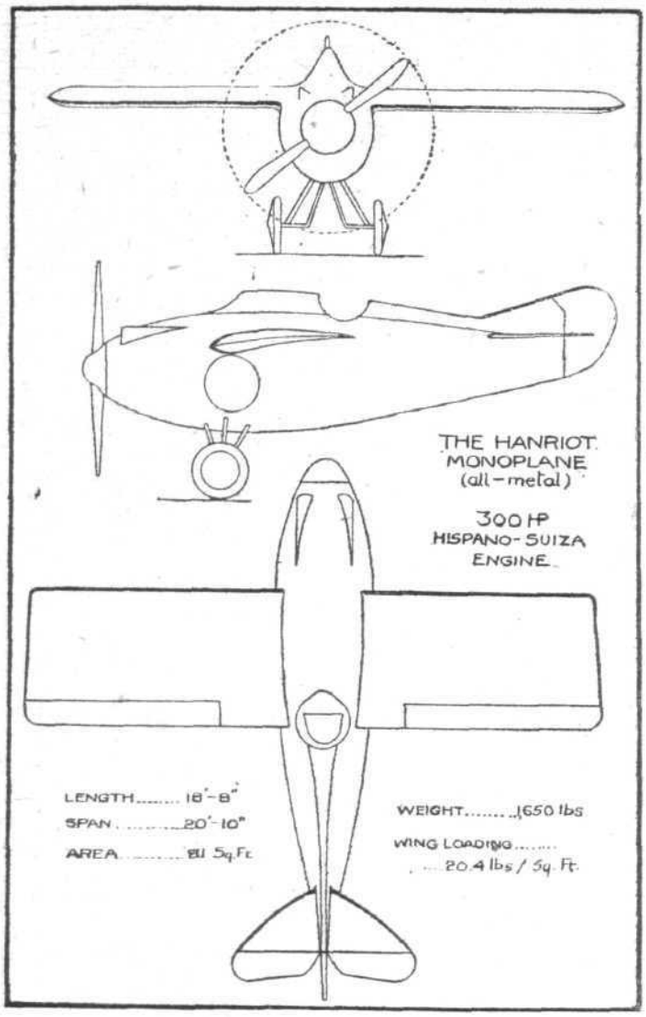
The de Monge on which de Romanet met his death was the same as that which he was to have flown in the Aerial Derby. It could be flown either as a monoplane or as a biplane. As a monoplane the wing area was 163 sq. ft., and as the weight was 2,100 lbs. the wing loading was 12.9 lbs./sq. ft., which is not excessively high for a racing machine. It is stated that just before the mishap de Romanet was making a speed of over 300 kilometres (about 186 miles) per hour. This is probably mere guesswork, but may be somewhere near the correct figure.



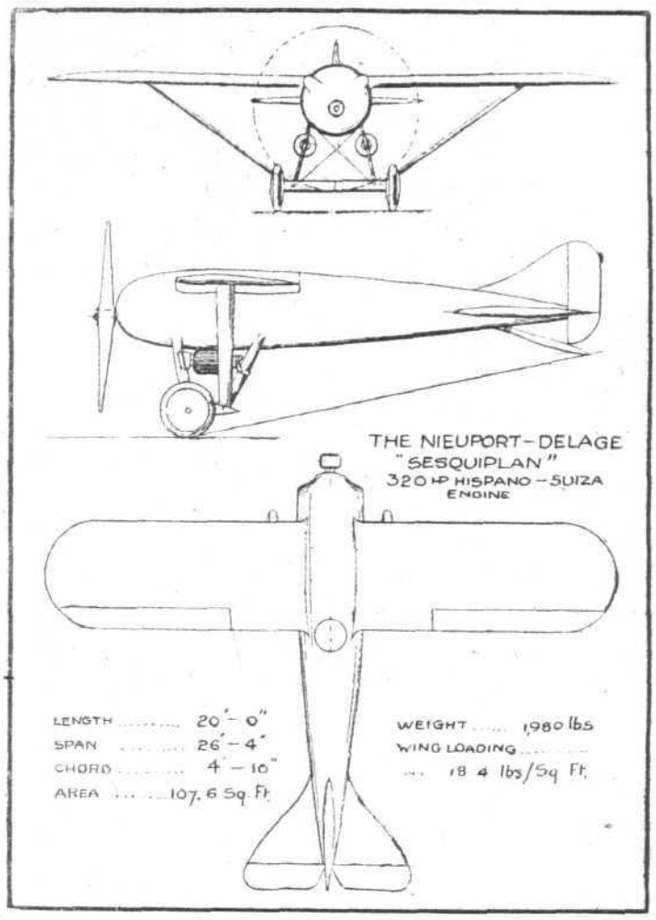
The de Monge biplane.

The Hanriot monoplane which is to be flown by Rost is of interest on account of the fact that it is of metal construction throughout. It is, as will be seen from the drawings, a small cantilever monoplane, but with non-tapering wings, and the undercarriage is designed to be lifted up during flight, the wheels then lying in the holes shown in the sides of the *fuselage*. The engine is a 300 Hispano-Suiza, and the machine has a calculated speed of 360 kilometres per hour (223 m.p.h.). The *fuselage* is well streamlined, and with such high wing loading (20.4 lbs./sq. ft.) and a retractable undercarriage it appears possible that a speed of somewhere round 210 m.p.h. may be attained. That it will actually do over 220 m.p.h. we beg leave to doubt. It is to be piloted by Rost.

The Nieuport-Delage "Sesquiplans" are to all intents and purposes monoplanes, but with a small plane covering-in the wheel axle as in some of the German Fokkers. Two of these machines have been entered, and will be flown by



The Hanriot monoplane.



The Nieuport-Delage "Sesquiplan."

Sadi Lecointe and Kirch. They are quite small machines, with streamline *fuselage* and a wing area of 107 sq. ft. Although not so high as that of the Hanriot, the "Sesquiplans" have a high wing loading—18.4 lbs./sq. ft., which, in view of the greater camber of the Hanriot wing, may well be at least equivalent to the virtual loading of the Hanriot with its higher lift coefficient. That the landing speed of all the French machines will be extremely high may be taken for granted. We only hope that no more accidents will mar the Deutsch Race.

DEATH OF BERNARD DE ROMANET

IT is with the most profound regret that we have this week to place on record the accident which resulted in the death of one of France's finest and most popular pilots, Count Bernard de Romanet. It appears that on September 23 de Romanet took the de Monge machine up for a trial flight. He had previously tested the machine as a biplane, but this is said to have been the first flight made with it as a monoplane; and it proved to be the last. According to reports, de Romanet took off well and climbed to a height of a few hundred metres. He then flattened out, and, it is thought, opened out the engine. The machine is stated by eye-witnesses to have "leapt forward" and to have proceeded at a great pace, judged to be over 300 kilometres (186 miles) per hour. Then the fabric of the left wing was seen to lift and fly back from the wing. The machine heeled over to the left, but for a few seconds it looked as if de Romanet would regain control, as he managed to right the machine. It then, however, got into a dive, and is stated to have dived straight into the ground. Needless to say, the unfortunate pilot was killed instantly by the terrible shock.

With regard to the cause of the accident, it is stated in our French contemporary *L'Auto* that it is thought that the stitching of the fabric was at fault, the distances between the stitches which attached the fabric to the framework being 12 centimetres instead of the usual 2 centimetres.

Le Marquis Bernard de Romanet came of a very old French family. He was born at Macon on January 28, 1894, and at the age of 18 he commenced his military service in the cavalry. He was made an officer during the War, and distinguished himself, first in the cavalry and later as a pilot. Bernard de Romanet was an officer of the Legion of Honour, and held the Croix de Guerre with 18 palms and the Medaille Militaire. At the end of the War he took to civil aviation, and was always a prominent figure in speed races, being the crack pilot of the Spad-Herbemont machines. At Monaco he won the speed race of 1920, and he put up a splendid flight in last year's Gordon-Bennett race, in spite of a broken oil pipe which forced him to land smothered in oil.

Some time ago de Romanet had a slight accident while testing a land machine with flotation gear. He alighted on the Seine, but the machine turned turtle instantly, and he was rescued by a motor-boat. While testing the de Monge machine for the Aerial Derby one of his wheels broke, without, however, causing serious damage to the machine. He was an interested spectator at the Derby, in which, but for the mishap, he would have been a competitor. His death will be regretted not only among his many friends, but in the world of aviation generally, for he was a great pilot, a great gentleman, and, last but not least, a real sportsman.

Sadi's Hustle

DURING a test flight at Villesauvage aerodrome (Etampes) on September 25, Sadi Lecointe is credited with having attained a speed of 339 kilometres (210 miles) per hour. His average speed worked out at 206 m.p.h.

D.H. Machines for Spanish Service

A NEW air line is to be opened between Spain (Seville) and Morocco (Laroche). The service will be operated by the Seville-Laroche Air Transport Company, and the service is to be a daily one. D.H. machines are to be used.

University Courses for R.A.F. Officers

IN order to afford R.A.F. officers facilities for advanced technical studies, arrangements have been made for a limited number of officers to attend certain courses at the principal Universities in the country. These courses have been instituted mainly to enable officers to qualify themselves for technical duties in engineering, wireless, navigation, research and other branches. The courses are the following: Special course in engineering subjects at Cambridge University; post-graduate course at the Imperial College of Science and Technology ("Design and Engineering"); special course in aeronautical research, also at Imperial College; course in mathematics and kindred subjects at Universities in the United Kingdom. Whilst attending these courses officers will receive full pay and allowances of their rank, and will be required to pay all personal expenses. Those taking the mathematics course will also be called upon to pay all University and other fees, and those who take the post-graduate course to contribute £20 towards the fee payable to the College. An officer will not be eligible to attend a University course unless he holds a permanent commission and fulfils certain other conditions.

Officers Seconded to R.A.F.

THE conditions of seconding of Regular Army officers to the Royal Air Force prescribe four years, including preliminary training, as the period of secondment. Officers must have at least two years' commissioned service, and be between the ages of 22 and 28 years on the date of seconding. They will be granted temporary commissions in the R.A.F., take rank and command accordingly, and receive R.A.F. rates of pay and allowances of their rank in the R.A.F. They will wear the new service uniform of the R.A.F., and the mess dress, and full dress (if and when re-introduced) of their Army service. A grant of £25 towards the cost of R.A.F. uniform will be paid, provided the officer was seconded after August 31, 1920. The period of seconded service will count towards retired pay under the same conditions as if the officer had remained with the Army.

Capt. Guest's Private Secretary

THE Air Ministry announces that Mr. T. A. Lewis, M.P., has been appointed Parliamentary Private Secretary to the Secretary of State for Air, in place of Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., who relinquished his appointment on August 19, 1921.

Baghdad to London in Six Days

AN officer of the Royal Air Force proceeding home from Mesopotamia in the ordinary course of duty has travelled from Baghdad to London in six days. He flew from Mesopotamia to Egypt in two days over the route which has been opened up by the Royal Air Force for the carriage of official mails.

Starting at Baghdad at 6 a.m. on the 15th of this month, the flight across the Syrian Desert to Amman, a distance of 515 miles, was made in 8¾ hours on the first day. The second day's journey commenced early, and by 9 o'clock Heliopolis was reached after a flight of 325 miles. From Heliopolis the journey was continued to Aboukir, the total distance covered on this day being 440 miles.

This flight was arranged to connect with the sailing of the S.S. *Vienna* from Alexandria Dock. Within 40 minutes of arrival at Aboukir the officer embarked for the remainder of his journey to England by sea and rail. He arrived in London at 8.5 p.m. on the 21st, 6 days and 14 hours after leaving Baghdad, having saved from 10 to 14 days in passage.

The air route linking Palestine with Mesopotamia was surveyed and organised by the Royal Air Force in June of this year. A regular fortnightly service by air for the carriage of official correspondence was commenced on August 1.

Formation of No. 6 Flying Training School

No. 6 Flying Training School has been formed at Manston, Kent, with effect from September 1, 1921.

R.A.F. Base, Gosport

THE following units will be comprised in the R.A.F. Base, Gosport, which will be formed with effect from October 1 next: Headquarters; No. 210 Squadron; Observers' Training Flight; Composite Flight; Development Flight; Stores Section; Pay and Accounting Section; Workshops.

Officers' Course in Air Navigation

A COURSE of instruction in air navigation open to R.A.F. officers holding permanent commissions will be held at Calshot early in 1922. Candidates will be required to undergo an entrance examination in arithmetic, general knowledge, dead reckoning, navigation and elementary electricity, which, in the case of officers serving in the United Kingdom and with the army of the Rhine, will be held at the Air Ministry on December 8 and 9. Officers serving in commands overseas will be examined locally.

Disbandment of No. 3 Group Headquarters, R.A.F.

HEADQUARTERS, No. 3 Group, Spittlegate, ceased to exist with effect from midnight, September 15, 1921.

Closing of Howden

ON September 20 the "R.80" left Howden Airship Station for Pulham, where she arrived safely. She was the last of the airships to be transferred, and Howden will now be closed.

Old Yarmouth (73rd Wing) Reunion Dinner

THIS dinner will be held as arranged on Saturday, Oct. 29. Names, addresses and acceptances to be forwarded at an early date to Major Galpin at Air Ministry, or to Capt. G. F. N. Bloom, 17, Welbeck Street, Cavendish Square, W.1. The final details will be issued at a later date.

NEW COMPANY REGISTERED

BERKSHIRE AVIATION CO., LTD., The Mulberries, East Hanney, Wantage, Berks.—Capital £1,000, in £1 shares. Acquiring business of aerial transport and motor engineers carried on by J. C. V. Holmes and J. C. C. Taylor at East Hanney, Berks, as the Berkshire Aviation Co.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: cyl. = cylinder; I.C. = internal combustion; m. = motors.

The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

APPLIED FOR IN 1920

Published September 15, 1921

12,457. M. M. KHOSROVANI. Self-levelling devices for aircraft, etc. (167,816.)
13,377. W. T. REID and BRISTOL AEROPLANE CO., LTD. Brakes for aeroplane wheels. (167,835.)
17,061. A. KNUBEL. Steering-wheels of aircraft, etc. (146,132.)
20,792. DEUTSCHE FLUGZEUG-WERKE GES. (in liquidation). Propellers and fuel containers of large aeroplanes. (148,256.)

Published September 22, 1921

8,397. DET TEKNISKE FORSOGSAKTIESELSKAB. Mechanism for oscillating wings. (158,202.)
16,752. H. JUNKERS. Armoured bodies for aeroplanes. (145,493.)
16,754. H. JUNKERS. Flying-machine bodies. (145,495.)
18,962. G. CAPRONI. Cellular structures of five-plane aeroplanes. (147,018.)
19,010. FAIREY AVIATION CO., LTD., and C. R. FAIREY. Jointing of structural elements in aircraft. (168,215.)
19,737. H. JUNKERS. Hollow supporting-surface for flying-machines. (147,734.)
23,790. H. BOOTH, J. W. COPLEY, and COMMERCIAL AEROPLANE WING SYNDICATE, LTD. Aircraft control mechanism. (168,241.)
26,732. SOC. ANON. DES AEROPLANES G. VOISIN. Removable hoods. (151,927.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages iii and xiv).

NOTICE TO ADVERTISERS

All Advertisement Copy and Blocks must be delivered at the Offices of "FLIGHT," 36, Great Queen Street, Kingsway, W.C. 2, not later than 12 o'clock on Saturday in each week for the following week's issue.

FLIGHT

The Aircraft Engineer and Airships

36, GREAT QUEEN STREET, KINGSWAY, W.C. 2.

Telegraphic address: Truditur, Westcent, London.
Telephone: Gerrard 1828.

SUBSCRIPTION RATES

"FLIGHT" *will be forwarded, post free, at the following rates:—*

UNITED KINGDOM	s.	d.	ABROAD*	s.	d.
3 Months, Post Free....	7	7	3 Months, Post Free....	8	3
6 " "	15	2	6 " "	16	6
12 " "	30	4	12 " "	33	0

These rates are subject to any alteration found necessary under abnormal conditions and to increases in postage rates.

* *European subscriptions must be remitted in British currency*

Cheques and Post Office Orders should be made payable to the Proprietors of "FLIGHT." 36, Great Queen Street, Kingsway, W.C. 2, *and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.*

Should any difficulty be experienced in procuring "FLIGHT" *from local newsvendors, intending readers can obtain each issue direct from the Publishing Office, by forwarding remittance as above.*